What Is Claimed Is:

1. A method for electrodeposited film formation by which a surface of an object to be treated, the surface at least permitting generation of charged particles when irradiated with a laser beam, is irradiated with a pulse laser whose pulse width is less than a picosecond; almost solely electrons are excited on the surface of the object to be treated to generate a state of non-equilibrium in either temperature or energy between the electrons and a grid; and an electrodeposited film is formed on the surface of the object to be treated using the electrons excited in that state of non-equilibrium.

2. A method for electrodeposited film formation by which a surface of an object to be treated, the surface at least permitting generation of charged particles when irradiated with a laser beam, is irradiated with a pulse laser whose pulse width is less than a picosecond; and an electrodeposited film is formed on the laser-irradiated part of the surface of the object to be treated using hot electrons generated by this laser irradiation.

3. A method for electrodeposited film formation, according to Claim 2, wherein the object to be treated is a substrate, and an electrode is formed as the electrodeposited film by metal-plating the surface of the substrate using a pulse laser whose pulse width is less than a picosecond.

4. A method for electrodeposited film formation, according to Claim 3, wherein

the electrodeposited film is formed by applying a bias voltage so as to inject electrons into the surface of the object to be treated when carrying out the metal-plating with the pulse laser whose pulse width is less than a picosecond.

5. A method for electrode formation comprising:

a step to form an electroconductive thin film over the surface of an insulator substrate;

a step to form an electrode over the electroconductive thin film by metal-plating using hot electrons generated by irradiating the electroconductive film with a pulse laser whose pulse width is less than a picosecond; and

a step to remove the electroconductive thin film by etching the whole surface of the insulator substrate.

6. A method for electrode formation, according to Claim 5, wherein

the electrodeposited film is formed by applying a bias voltage so as to inject electrons into the electroconductive thin film when carrying out the metal-plating over the electroconductive thin film with the pulse laser whose pulse width is less than a picosecond.

7. A method for electrode formation comprising steps of:

etching the pulse laser-irradiated part of an insulator thin film, formed over the surface of a substrate, by irradiation with a pulse laser whose pulse with is less than a picosecond, to expose an electroconductive part underneath the insulator thin film; and

forming an electrode by partially metal-plating the exposed electroconductive part using hot electrons generated by irradiation with a pulse laser whose pulse width is less than a picosecond.

8. A method for electrode formation, according to Claim 7, wherein

a bias voltage is applied so as to inject electrons into at least the surface of the substrate when carrying out the metal-plating with the pulse laser whose pulse width is less than a picosecond.

9. A method for electric circuit fabrication by which a three-dimensional electric circuit spanning the depth of a substrate by using the method for electrode formation claimed in Claim 7.

10. A method for electrodeposited film formation, according to Claim 4, wherein

a plating electrode assembly for use in the metal-plating has a triple electrode configuration consisting of an electrode to be machined, an opposite electrode and a reference electrode; and a voltage of -100 mV to -1.2 V is applied as the bias voltage between the electrode to be machined and the reference electrode.

11. A method for electrode formation, according to Claim 6, wherein

a plating electrode assembly for use in the metal-plating has a triple electrode configuration consisting of an electrode to be machined, an opposite electrode and a reference electrode;

and a voltage of -100 mV to -1.2 V is applied as the bias voltage between the electrode to be machined and the reference electrode.

12. A method for electrode formation, according to Claim 8, wherein

a plating electrode assembly for use in the metal-plating has a triple electrode configuration consisting of an electrode to be machined, an opposite electrode and a reference electrode; and a voltage of -100 mV to -1.2 V is applied as the bias voltage between the electrode to be machined and the reference electrode.

13. A method for electrodeposited film formation, according to Claim 1, wherein

a pulse of not more than 500 femtoseconds is used as the half-width of the irradiating pulse laser.

14. A method for electrode formation, according to Claim 5, wherein

a pulse of not more than 500 femtoseconds is used as the half-width of the irradiating pulse laser.

15. A method for electrodeposited film formation, according to Claim 1, wherein

1 to 30 W/cm^2 is used as the intensity of the irradiating pulse laser.

16. A method for electrode formation, according to Claim 5, wherein

1 to 30 W/cm^2 is used as the intensity of the irradiating pulse laser.

17. A method for electrodeposited film formation, according to Claim 3, wherein

one of Cu, Pt, Zn and Ni is used as the plating metal.

18. A method for electrode formation, according to Claim 5, wherein

one of Cu, Pt, Zn and Ni is used as plating metal.

19. A method for electrodeposited film formation, according to Claim 10, wherein

one of Au, Cu, Pt and Zn is used for the electrode to be machined.

20. A method for electrode formation, according to Claim 11, wherein

one of Au, Cu, Pt and Zn is used for the electrode to be machined.

21. A method for electrode formation, according to Claim 12, wherein

one of Au, Cu, Pt and Zn is used for the electrode to be machined.

22. A method for electrodeposited film formation, according to Claim 4, wherein

the concentration of the aqueous solution of the plating metal is 2 to 18% wt.

23. A method for electrode formation, according to Claim 6, wherein

the concentration of the aqueous solution of the plating metal is 2 to 18% wt.

24. A method for electrode formation, according to

Claim 8, wherein

the concentration of the aqueous solution of the plating metal is 2 to 18% wt.

25. A finely machined electrode formed by the method for electrodeposited film formation claimed in Claim 3.

26. A finely machined electrode formed by the method for electrode formation claimed in Claim 5.

27. An electrode pattern formed by the method for electrodeposited film formation claimed in Claim 3.

28. An electrode pattern formed by the method for electrode formation claimed in Claim 5.

29. A three-dimensional electric circuit formed by the method for electric circuit fabrication claimed in Claim 9.

30. An apparatus for electrodeposited film formation comprising:

an electrolyte solution bath in which an electrolyte solution containing ions to constitute an electrodeposited film is held and wherein an object to be treated of which at least the surface permits generation of charged particles when irradiated with a laser beam and onto which the electrodeposited film is to be deposited is held; and

a laser device for irradiating the object to be treated positioned in the electrolyte solution with a pulse laser whose pulse width is less than a picosecond to thereby excite electrons in the laser-irradiated part to cause the electrodeposited film to be formed in the laser-irradiated part.

31. An apparatus for electrodeposited film formation, according to Claim 30, further provided with:

an opposite electrode held separated from the object to be treated in the electrolyte solution; and

a power source for applying a bias voltage between the object to be treated and the opposite electrode.